

### **Abstract of the Disclosure**

An improved method is disclosed for the encoding phase for Wavelet-based compression of digital data representing an object or image. Subband decomposition transforms the data into hierarchical tree data. Two terms are precomputed: the highest bit-plane in which any descendant of a node  $v$  has a non-zero bit ( $B_1(v)$ ) and the highest bit-plane in which any indirect descendant (grandchild and beyond) becomes significant ( $B_2(v)$ ). Node traversal is initiated but its extent is limited by a fixed bit-budget. The number of bits emitted by a node as a function of the bit-plane are counted through to the last bit-plane which exhausts the bit-budget. The user can predetermine the coefficient, bit-plane and specific bit at which the algorithm will halt. The tree structure is read only once, thus greatly accelerating the encoding and reducing the memory reference rate by a factor of 2 or more. Accumulators for each of the stacked bit-planes are provided which are incremented as each said Wavelet coefficient is produced, by the number of bits that the coefficient adds to the relevant bit-plane.